

# Investigation of Demographic Properties and Motivation Factors of Physics Teachers

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## Abstract

Scientific and technological developments resulted in an increase in the requirement of education in the society. In addition to this, the expectations from teachers differed and the need for more qualified teachers also increased. One of the factors affecting the quality of teachers is their motivation. In this research, it was aimed to reveal both demographic and professional profiles of secondary school physics teachers together with factors motivating themselves. General survey model was used in the research. Motivation factors priority order questionnaire was used as a data collecting tool. There were also questions in the questionnaire which determined the demographic and professional profiles of teachers. Motivation factors priority order questionnaire constituted of 6 different motivation factors. The research was performed on 103 physics teachers who were working at public and private high schools in Konya city center and in some districts. The statistical analysis of the research was carried out with SPSS 15 software by using percentage, frequency, Kruskal-Wallis H test, and Mann Whitney U test. 80.6 % of physics teachers in the sample were male and the rest was female. The results of the analysis indicated that the most motivating factor for physics teachers was factors related with advantages and the least motivating factor was related with the profession. The interesting and challenging thing here is that the factors "related with profession" were at the sixth and so the final stage. Since factors such as making different lectures, following new source materials, information exchange with colleagues, presence of education technology and growing good students were at the final stage for motivation of teachers, this presents serious challenges in terms of future of teaching profession and growing of rising generation.

## Key Words

Physics teacher, Motivation, Demographic Properties.

One of the principal factors of education activities is the teacher. A teacher is a person growing the individuals who will be the future of the society and take the country much further. It's a known fact that the influence of a teacher on student and education programs is higher than other factors (Erdem, 1998). The teachers should have field information, use education methods effectively, have information and comprehension about development psychology and learning-teaching strategies, consider personal differences of students, communicate well with colleagues at school in order to grow manpower necessary for societies and improve the quality of

life (Garmston, 1998). The most important extent of the problems related with education system applications which always constitute the agenda of Turkey is training of teachers and the quality of trained teachers (Güzel, 2005). The quality of teachers is very important in succeeding and learning of students (Friedman, 2000; Korkut & Doğan, 2001). It's necessary for teachers having the responsibility of training human power in the quantity and quality need of countries to get long-term education and to be matured in their professions in order to work in education institutions more efficiently and to maintain teaching and education periods appropriate for technological developments necessitated by the era (Üstüner, Ersoy, & Sancar, 2000). For this aim, it's necessary for teachers to adapt and train themselves continuously, shortly, to get a professional teacher identity (Azar & Çepni, 1999; Erdem, Üstüner, & Sancar, 2000)

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Today success of institutions at every stage is dependent on providing the motivation of employees working at that institution (Yigenoğlu, 2007). For this reason, teacher motivation at educational institutions is an important research subject. Motivation means interior and exterior-sourced impulse, desire and wishes that lead, support and control human behavior by affecting. Motivation is a factor which freshens up, relieves, leads and controls our behaviors for a target. Many definitions were given for motivation (Eren, 1998; Göral, 2002; Köktürk, Gürdal, Köktürk, & Uzgören, 2000). The reason is that researchers consider motivation from various aspects which is basically a psychological matter of fact.

Improving motivation will increase the effectuality and efficiency in learning and teaching. Motivation theoretically examines the factors which enforce the individual to act specifically on his/her side. It's interested in targets and aims causing the activities of the individual. Northcraft and Neale (1990) tried to determine which requirements in inner world of the individual were effective on his/her targets. Cannon and Simpson (1985) dealt motivation sometimes as a direction of a manner and sometimes as a factor independent of the manner. The concept of motivation gradually became important. The importance of motivation should not be underestimated in terms of efficiency and success of individuals working in institutions (Sabuncuoğlu, 1995). It was determined that tools such as codetermination of labor, transfer of authority and responsibility, competition, active communication, quality of work life, appreciation and awarding, career development, education opportunities were effective on the motivation of individuals working in the institutions (Koçel, 2001; Osmay, 2002). Researches and applications of motivation are not always easy since human beings are social beings having the characteristics of different psycho-social properties and they are different in terms of motivational tools (Evans, 2000; Latham, 1998; Osmay, 2002).

Motivation of teachers is extremely important for both motivation of students in the classroom and advanced education reforms that might be realized. Motivated teachers have important functions 1. in the realization of education reforms, 2. in the application of alterations revealed, 3. in providing success and satisfaction (Azar & Henden, 2003; Cenkseven-Önder & Sarı, 2009; Günbayı, 2001; Jesus & Conboy, 2001; Yazıcı, 2009). The wages given to the teachers, physical conditions of schools, relationships between studies, type of control, educa-

tion upward and development opportunities may affect job satisfaction and motivation of teachers negatively (Günbayı, 2001). Teachers who do not provide success and satisfaction due to low motivation have high levels of stress (Pithers & Fogarty, 1995). It's necessary to arrange education programs such as "relationships between individuals" and "overcoming the stress" for teachers and directors and to enhance the levels of school life quality of teachers (Cenkseven-Önder & Sarı, 2009). The studies performed indicated that factors such as task duration, gender, management, physical environmental conditions, private or general education had effects on the motivation of teachers (Klecker & Loadman, 1997; McMillan & Ma, 1999; Mertler, 2002). As well as the subject of motivation being very important for teachers, the findings related with which incentives or motivational were considered important by teachers are quite limited. According to Cemaloğlu (2002), the studies performed by Rand Corporation indicated that the most important incentive for teachers was providing professional satisfaction of teachers.

It was determined that there are important problems related with motivation of teachers in Turkey. There are important administrative problems as well as factors such as inadequacy of physical potentials in most of the schools, low teacher wages, social impossibilities. It was emphasized in some studies that the directors working in schools or in National Education establish relationship with teachers adequately, do not guide, are prejudiced in the evaluation of staff members and work (Azar & Henden, 2003; Barlı, Bilgili, Çelik, & Bayrakçeken, 2005; Cemaloğlu, 2002; Cenkseven-Önder & Sarı, 2009; Çubukçu & Döndar, 2003; Günbayı, 2001; Okutan, 2003; Yüksel, 2001).

Today which is also a technological era, physics and science lectures constitute the basis of modern world view which is mostly prepared with objective, reasonable, scientific and technological tools. Especially work descriptions of physics and the results obtained affect other disciplines and practically find wide field of application due to this property (Fishbane, Gasiorowicz, & Thornton, 1996). Since physics education has big contribution in the formation of objective, reasonable and scientific thought system, physics education is considered important in many countries. There are many factors affecting the quality of physics education. The studies performed indicated that the most important factor affecting the success and failure of students was teachers (Gürdal, Baştaş, & Ertuğrul,

1990). The primary factor affecting the quality of physics teachers is motivation of them and their job satisfaction. According to education statistics of national center in Arizona in 1997, every year 7% of teachers pull out of work because of discipline and motivation problems of students, inadequate administrative mentality and low wages (Hardy, 1999).

The motivation of teachers is extremely important for both motivation of students in the classroom and advanced education reforms that might be realized. Motivated teachers have a very important function; (i) in the realization of education reforms, (ii) in the application of alterations revealed, (iii) in providing success and satisfaction (Azar & Henden, 2003; Cenkseven-Önder & Sarı, 2009; Günbayı, 2001). Recently, it was observed that the interest of students towards math courses in secondary schools declined. Especially physics lecture in our country is the lecture which is maintained with fear of failure by the students. The researches conducted indicated that physics lecture is hardly understood by students (De Lozano & Cardenes, 2002). Many students regard physics as a collection of laws and formulas (Hammer & Elby, 2003). One of the reasons for students not being interested in physics sufficiently might be due to inadequate motivation of physics teachers working at secondary schools. This problem can be solved by working to increase motivation and work satisfaction of physics teachers together with recognizing them in every respect and knowing their desires.

The problems of education in our country grow still more as physics teachers steer away from education sector. In order to prevent this, to make teaching profession a preferred one and to present healthy suggestions to decision-maker positions, it's necessary to profile present physics teachers and to search factors motivating them. It should not be ignored that physics teachers loving their professions and having high motivations have an important role for physics lecture to be liked.

### Purpose

This research was carried out with the aim of getting demographic and professional profiles of secondary school physics teachers, determining the levels of factors motivating (advantages, indoor environment at schools, profession, relationships between parts, students, related with personality) themselves, and revealing the variation of these factors in terms of profile properties.

### Research Problem

The research question was based on the question "What are the demographic properties of physics teachers working in Konya city center together with its districts and levels of factors motivating (advantages, indoor environment at schools, profession, relationships between parts, students, related with personality) themselves?"

### Research sub-problems

What are the demographic properties of physics teachers?

1. Do the motivation factor levels of physics teachers motivating themselves differ depending on their demographic properties?

### Method

#### Research Design

Survey method was used in this research. Survey study is a kind of research which is carried out in order to determine present situation. The simplest way of obtaining a wide sample is questionnaires. For this reason, questionnaires are used in survey studies. Sectioning is adopted among survey models since comparisons are made in terms of variables such as different gender, age, seniority and schools at which they work and moreover, relational survey approach is adopted since it determines the relationships between continuous variables of the research (Çepni, 2010).

#### Universe and Sampling

The population of the research was constituted of physics teachers who were working at public and private high schools in 2006 - 2007 education year in Konya city center and in some districts. 103 physics teachers constituted the sample of the research.

#### Instrument

Motivation factors priority order questionnaire was used as a data collecting system in the research. In the beginning of questionnaire (first part), some questions were included in order to determine demographic properties (gender, age, seniority and type of school at which they work, their situation for participating in in-service training, their situation for giving private tuition) of teachers.

The second part of "Motivation Factors Priority

Order Questionnaire" was constituted of 6 different motivation factors. These factors were related with advantages, indoor environment at schools, profession, relationships between parts, students and personality. Each factor was subjected to grading procedure within the compass of the system from one to six and grading scale was obtained. "Motivation Factors Priority Order Scale" used in this questionnaire belongs to Köktürk (1997) and was cited from the research of Çermik (2001). Cronbach Alpha reliability coefficient of "Motivation Factors Priority Order Scale" applied to physics teachers who work in Konya city and its districts was found as .79 for this research.

### Analysis of Data

The statistical analysis of the research was carried out with SPSS 15.00 software. Teacher motivation factors of physics teachers constituting the sample group were subjected to Friedman test in order to examine whether there was a statistical difference between ordering of six factors depending on findings obtained from priority order scale. After determination of difference for orders of factors in terms of statistics, Mann-Whitney U test and Kruskal-Wallis H test were used in order to determine the difference between orders of factors in terms of personal information.

For age and seniority variables, Kruskal-Wallis H test was used where Mann-Whitney U test was used for binary comparisons (Çepni, 2010).

### Process

The addresses of all schools, where the research would be carried out, were determined, each school was visited one by one and interviews were performed with physics teachers. The questionnaire was supplied to the teachers who would like to be helpful in the research and they were requested to answer them in a quiet atmosphere. These questionnaires were distributed to 110 physics teachers and 103 of them were taken back. Although 7 physics teachers working at different schools determined that they would send the questionnaires afterwards, they didn't send.

### Results

In this section of the research, the data collected by questionnaires from 103 physics teachers in the sample group were presented as tables and then commented on them. At the first stage, the results of questionnaires applied to sample group were

tabulated as frequency and percentage distributions.

In the second stage of the research, results of statistical analysis which was performed depending on the findings obtained from motivation factors priority order scale for physics teachers were presented.

### Discussion

The most important concern of today's teachers as part of effectuality, performance and quality is difficulties they experienced in accommodating themselves for developments and alterations depending on dizzyingly elapsing information and technology. It's desired for teachers to be individuals who can tide over by continuously developing themselves and have high motivations. It was indicated that variables such as age, gender and experience as well as many properties that a teacher should have are effective on the application of education programs (Evans, 1986). 80.6 % of physics teachers in the sample group were male and 19.4% of them were female (Table 1). In the research of Çermik (2001), it was determined that 52.0 % of physics teachers were male and 48.0 % of them were female. Although the rate of female teachers in our country is not low, it's expected to increase still more. In the study conducted by Öztürk (2007), the sample consisted of chemistry teachers out of which 46.8 % were male and 53.2 % of them were female. In the research done by Atav (2005), in analyzing the participants in terms of gender, it is found out that the biology teachers consisted of 60% out of females. The study of Barlı et al. (2005) shows that primary school teachers consist of 39.6 % out of male and of 60 % out of female personnel. It can be seen that primary school, chemistry, and biology teaching branches are preferred by females more than males. Although the number of female teachers is not scarce in our country, it is expected that their numbers will increase in future. In the (2004) report of UNESCO Institute for Statistics (UIS), it is stated that the ratio of females in the profession is related in general to the developmental level of the countries; however, there was an increase in the number of female teachers from the 90's on, but this ratio is in many countries still under 50%.

In this research, 9.7 % of physics teachers in the sample group were found between 21 and 30 years old, 54.4 % of them were between 31 and 40 years old, 29.1 % of them were between 41 and 50 years

old and 6.8% of them were older than 51 years old (Table 2). Similarly, in the research of Çermik (2001), 28.0 % of physics teachers in the sample group were between 20 and 29 years old, 33.3 % of them were between 30 and 39 years old and 38.7 % of them were older than 40. In recent years, the decrease in the number of physics, chemistry and biology teachers inducted by MNE indicated itself in the age distribution. According to the UIS (2004) and Information on Education Systems and Policies in Europe [EURYDICE] (2004) reports, the teachers in the developing countries are in general young and inexperienced. In many of these countries 30 % of the teachers are under the age of 30. In some countries this ratio increases to 50.0 %. In the developed countries; however, the ratio of the teachers, who are 40 and above, is higher. In the study of Ündar (2005), the ratio of preschool teachers with an experience between 0-5 years is 49 %

When the sample group in this research was considered in terms of professional seniority, 11-15 senior teachers with 42.7 % rate were the first (Table 1). Brickhouse (1990) and Lederman (1999) compared teaching plans and classroom-applications of biology teachers having a senior less than 5 years and those having 14-15 year-senior and determined that there was a big difference between two groups in favor of teachers having 14-15 year-profession periods.

It was determined in this research that teachers having 0-5 year-senior participated in in-service training (77.7 %) at the furthest (Table 1). The ratio of the teachers who have not attended any in-service training courses is determined as 26 % in the research made by Eşme, Temel and Kuru in the year 2003. In-service training nowadays is as important as pre-service training in order to provide the persistence in the education of teachers. For this reason, teachers should be warned and encouraged to attend in-service training. In the study of Çermik (2001), among the factors motivating physics teachers; those of prime importance are the ones related to character, in the second place those related to school, in the third those related to the students, in the fourth those related with the profession, in the fifth to the advantages and in the last place factors related to the different sides are given. As it can be seen in this study, profession related factors rank last. Similarly, Azar and Henden (2003) came in their study to the conclusion that; among factors of motivation for primary school teachers, they were not satisfied with payment listed among the advantages; however, they were satisfied with the inter-

personal relations and individual factors among the relationship factors. Günbayı (2001) made a research on job satisfaction (job, the qualifications of the job, administration and inspection, payment, career and education, development and improvement opportunities, working conditions, and relationship among the workers) among the motivation factors of teachers with 221 teachers working at 33 primary schools. He found that the teachers had a medium job satisfaction level related to their working condition and low job satisfaction level related to their payment. In their research Cenkenseven-Önder and Sarı (2009), found that "status", "coping with stress", and "school administration" of life satisfaction, the cognitive component of subjective well being of teachers determining the teacher motivation were meaningfully related to the positive feelings' "status", school related emotions" and "teacher variables" of the emotional component of teachers subjective well. Karaköse and Kocabaş (2006) determined that the positive attitudes and behaviors of the principles in private schools have a positive impact upon the motivation of the teachers to their tasks; whereas the participants in state run schools do shared this view less. The teachers, both in private and state run institutions, stated that their profession enabled them to evaluate their own performance and that they could reach their goals conducting their profession.

Whereas this result is similar to the findings of Barlı et al. (2005), McMillan and Ma (1999), and Mertler (2002), there are also some reports in the literature expressing just the opposite. Günbayı (2001) found that the male teachers' administration and inspection styles, working conditions, and payment among the factors of job satisfaction is higher than those of female teachers. Klecker and Loadman (1997) stated that teachers time in their professions have not had any effect on their motivation; however, Mertler (2002) and Barlı et al. (2005) stated that the time of the teachers in their professions had a positive correlation with their motivation.

In the present study, in the analysis made for teachers motivational factors primary sequencing scale according to postgraduate education variable a positive relation was found between school environment, personality factors and the postgraduate education variable groups. Bilgiç (1998) determined in his study that employees with better education had higher productivity levels and developed less negative feelings towards their jobs.

In the analyses conducted for teachers motiva-

tional factors primary sequencing scale, there was not a meaningful difference between in-service education and private tuition (Table 9), (Table 10). A statistically significant difference was found only between interpersonal relations and in-service education variable among the six factors within the study of Çermik (2001). The interpersonal relation factor means of the teachers who participate in in-service education programs is higher compared to those who have not participated.

In this research, the rate of physics teachers in the sample group who were studying for master degree was very low. Goldhaber and Brever (2000) indicated that doing master degree for teachers positively affected students and increased their success.

According to ordering results of six factors motivating physics teachers themselves, the first one was factors "Related with Advantages", the second one was factors "Related with indoor environment at schools", the third one was factors "Related with Students", the fourth one was factors "Related with Relationships between Parts", the fifth one was factors "Related with Personality" and the final one was factors "Related with Profession" (Table 2). The significant difference in factors related with advantages was in favor of teachers working at public schools. The difference in factors related with profession was in favor of teachers working at private schools (Table 8). Since private schools have a higher socio-economical level than public schools, the motivation of teachers working at these schools was improved.

In the analysis among six factors performed in terms of gender, a significant difference was found in the factors related with advantages and profession. In the factors related with advantages, it was determined that male teachers were motivated more than female teachers while female teachers were motivated more than male teachers in the factors related with profession. Günbayı (2001), indicated that male teachers had more work satisfaction than female teachers for the work satisfaction factors of management and control style, working conditions and wages.

In the analysis performed in terms of gender within these six factors, a significant difference was found for factors related with advantage and profession when compared to gender. In the factor related with advantages, male teachers were motivated more than female teachers while it was observed in the factor related with profession that female teachers were motivated more than male teachers (Table 5). In the research of Çermik (2001), a significant dif-

ference was determined in terms of gender just in the factor related with students. Çepni and Küçük (2003) determined in their research that as professional experiences of teachers increased, their attitudes towards researches substantially decreased. Similarly, McMillan and Ma (1999) concluded that as the professional seniority of teachers increased, their motivation decreased.

### Suggestions

General results of this study which was aimed to determine demographic and professional profiles of secondary education physics teachers together with the factors motivating themselves can be given as follows:

- 1) 80.6% of physics teachers in the sample group were male and 19.4% of them were female. 9.7 % of physics teachers in the sample group were found between 21 and 30 years old, 54.4% of them were between 31 and 40 years old. When the sample group in this research was considered in terms of professional seniority, 11-15 senior teachers were the first (42.7 %).
- 2) According to ordering results of six factors motivating physics teachers themselves, the first one was factors related with advantages, the second one was factors related with indoor environment at schools, the third one was factors related with students, the fourth one was factors related with relationships between parts, the fifth one was factors related with personality and the final one was factors related with profession.
- 3) In the ordering of motivation factors related with advantages, a significant difference was found in favor of teachers working at public schools. Teachers working at public schools found factor related with advantages more motivating than teachers working at private schools.
- 4) In the ordering of motivation factors related with advantages and profession, a significant difference was found between genders in terms of statistics. In the factor related with advantages, male teachers were motivated more than female teachers while the most motivating factor for female teachers was the one related with profession.
- 5) In the ordering of factors related with advantages, profession and relationships between parts, significant differences were found between age groups in terms of statistics.
- 6) The difference between senior groups was found statistically significant just in the factor related with profession. Teachers with 0-5 year-experiences



have the highest motivation and the teachers with 26+ year-experiences have the lowest motivation.

7) The group not doing master degree found indoor environment of schools more motivating than the group doing master degree. On the other hand, the group doing master degree found personality factor more motivating than the group not doing master degree.

The following suggestions can be made according to the results of the research:

1) Physics teachers develop themselves and should be encouraged to do master degree related with their field of study.

2) The subject of teacher motivation should always be remained on the agenda, attraction should be drawn to this subject and contributions should be made for the efforts in the improvement of motivation factors.

3) Since increase in motivation will also increase the effect and efficiency in learning and teaching, necessary regulations should be made by Ministry of National Education in order to increase the motivation of our teachers.

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